The Marriage Machine: Mobile Persuasion/Behavior Change

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Abstract. The author's firm undertook the Marriage Machine project aimed to persuade couples to open themselves up towards techniques of daily practice and interaction with their partners, with the objective of making their relationships with each other deeper, more enjoyable, more personally enriching, and educational. In a user-centered design process, we planned, researched, analyzed, designed, implemented (sample screens), evaluated, documented, and prepared training documents for a mobile phone application conceptual prototype. The Marriage Machine combines marriage/bonding theories with information design/visualization and persuasion design. This paper explains the development of the Marriage Machine's user-experience design. A more complete description appears in [22].

1 Introduction

Marriage is a significant component of all cultures. Despite the abundance of marriage theories and training oriented to turning theory into practice, people often fail to adhere to principles due to increasing economic, social, and political pressures and consequent stress. In the US, 37.5 % of the US population between 15 years and older are married, according to [2]. More importantly, 11.7 % of the population are separated or divorced, according to [3]. By combining information design and persuasion/motivation theory, with a particular focus on the works of Maslow's theory of basic human needs [24] and Fogg's theory of persuasion [6, 7], the use of the Marriage Machine could prompt couples to change their behavior to make relationships with each other more enjoyable and personally enriching. The success and effectiveness of the described approach, *i.e.*, the combination of information design with persuasion design in order to promote behavioral change of mobile application users, has already been studied and realized in several previous projects of the author's company: the Green Machine [23], the Health Machine [12], the Money Machine [13], the Story Machine [14], the Innovation Machine [15], the Driving Machine [16], the Learning Machine [17], the Travel Machine [18], the Happiness Machine [19], and the Marriage Machine [21]. All of the past Machine projects rely on the conceptual design of an application through a user-centered user-experience development-process, as defined and explained below.

2   UX Design: User-Centered Design, and Persuasion Theory

User Experience (UX), user-centered design (UCD), use scenarios, and persona concepts/practice are described well by Hartson and Pyla [9]. The science of persuasion in Cialdini [4] concentrates particularly on psychological aspects of persuasion. In alignment with Fogg's research of persuasion [6, 7], we have defined six key steps to achieve behavioral change with requirements for each step:

- Attract user via business marketing
- Increase frequency of using application
- Motivate changing some habits: interaction with and openness towards others, experience and observation of differences, ways of journaling or diary documentation
- Teach how to change habits
- Persuade users to change habits (short-term change)
- Persuade users to change general approach to objectives, people, objects, contexts, obstacles (long-term, or life-style change).

We also drew on Maslow's theory of human needs [24] adapted to the Marriage Machine context: Safety and security is met by the assistance of an advisor and by the provision of obstacles-, fun-, human-contact-, and other-related information and tips. Belonging and love is expressed through friend, family and social sharing, and support. Esteem can be satisfied by social comparisons that display progress and destination expertise, as well as by self-challenges suggested by an advisor that displays goal-accomplishment processes. Self-actualization is fulfilled by being able to follow/retrace continuous progress/advancement in a personal diary.

3   Theoretical Background and Research

Marriage exists in most cultures, but has changed over the centuries. The traditional term refers to a solemn act between a woman and a man, empowered with religious and/or civil legitimacy. Today it also includes couples who may opt for a serious relationship, without gender, legal, and/or religious sanctions. We adopt the latter definition, intending our application for committed couples. Marriage is highly subjective, requiring an interdisciplinary approach to issues, e.g., positive psychology, marriage theory, philosophy of marriage, and emotional design. We examined [1, 5, 8, 10, 11, 25] and developed healthy-marriage principles, insights/design principles:

Principle 1. Enhance Your Love Map: Use periodic marriage checkups. Know each other's objectives, goals, hopes, and worries.

Principle 2. Nurture Fondness and Admiration: Remind users of partner's positive qualities and express fondness and admiration. Enhance users and partner's physiological intimacy. Enhance users and partner's emotional connection.

Principle 3. Turn Toward Each Other: Make "bids" for partner's attention, affection, humor, or support.

Principle 4. Let Your Partner Influence You: Share power and decision-making.

Principle 5. Resolve Conflict: Avoid conflicts. Solve solvable problems.

Principle 6. Create Shared Meaning/Value: Marriages with shared sense of meaning result in less conflicts and decrease likelihood of gridlock.

Principle 7. Cultivate Excitement: Try new and exciting activities together to rekindle feelings.

Insight 1. Marriage Improvement is an Objective: Assist users to achieve specific goals/steps in a "journey through marriage." Directions should be "chunked," so people can easily remember what to do.

Insight 2. Marriage is Discipline, a Constant Reminder to Change Attitude: Remind people to be mindful. Expedite change by helping users to reflect.

Insight 3. Marriage is in a Constant State of Flux: Customize to different users in different life stages. Directions should be adaptable to each user at time of use.

Insight 4. Balancing Engagement and Persuasion is Key: Persuade users to do certain activities with the least friction possible.

Tactics for Marriage Machine: Based on our research, we developed the following measures that could be considered relevant and practical:

- Involvement
- Personalization
- Goal/habit-centered
- Entertainment
- Connectedness
- Accomplishment.

4 Market Research

AM+A did market research with potential customers using graduate marketing students, University of California at Berkeley Extension's International Diploma Program, to know more about people's general usage of smartphones and mobile applications and specifically "relationship behaviors" with them. Market research included secondary, qualitative, and quantitative research. Details appear in [22].

5 Competitive Product Analysis

We compared 10 smartphone applications' screens and customer reviews to derive their benefits/drawbacks. This analysis helped us to develop detailed functions, data, information architecture (metaphors, mental model, and navigation), and look-and-feel (appearance and interaction). Details appear in [22]. Most mobile applications emphasize private connection between the couple. Few if any take a holistic approach to help users realize and achieve success in their relationships.

6   Personas and Scenarios

We used use scenarios for different kinds of marriages functions and personas. Personas were "double personas," rare in UX literature. Our details appear in [22].

7   Information Architecture

The Information Architecture (IA) derived from a model in previous Machines with five primary "modules." We altered details to fit our needs/requirements (Fig. 1).

Dashboard: This landing page provides an overview of the user's behavior change status. The user gets a view of his/her goals and where s/he stands in achieving them.

Roadmap: The Process View module shows a "road map" of the process with details of each objective/goal. The user sees the goal-progress, as well as next steps.

Social Network: Focused, subject-matter-based connections with friends, family, and/or like-minded people sharing similar goals or eager to support others.

Tips/Advice: Provides focused knowledge about a given topic to give users insight into the habits they wish either to get rid of or adopt.
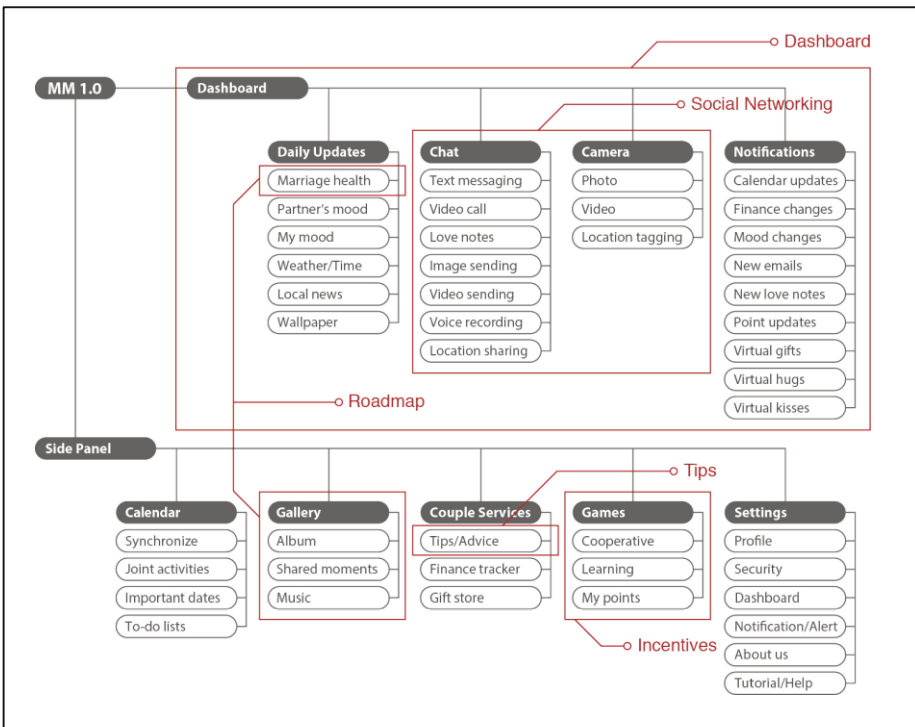

Fig. 1. Information architecture of the marriage machine.

Incentives: Fun-filled, engaging ways to change behavior, e.g., gamification and leaderboards, as powerful tools to motivate users, with virtual of real incentives.

The Marriage Machine groups key components/functions grouped into three "tabs":

Tab 1: Dashboard: The 'homepage' contains the most important information users may need at any time. All of the elements are optional and customizable.

Current Time and Date/Daily Updates: An in-app "news"-source for users:

Marriage health: Depicts the relative "health" of a couple's marriage, 0 % to 100 %, based on an algorithm taking into account finances, frequency of app use, performances on games and quizzes, number of items purchased in the gift store, number of love notes sent, average mood of each partner, and number of virtual kisses/hugs sent. Percentages in the marriage health can stimulate users to discover ways to improve that number, and to proceed in their learning process.

Partner's mood: Allows the user to view his/her partner's mood.

My mood: Allows the user to edit his/her own mood.

Weather/Time/Local News: Displays user's/*partner's* weather, time, and local news.

Shared Wallpaper: User can edit shared wallpaper on their dashboards.

Chat: Supports the following modes of communication:

Text messaging:

- Doodle
- Virtual displays of affection (virtual hugs/kisses)
- Screen Freeze: temporarily "freezes" the partner's screen, such as during a heated argument, forcing the partner to tap on the screen repeatedly until the ice is broken
- Send offline messages
- View availability status.

Video Call: Users can quickly swipe to toggle between text messaging to video calls.

Love Notes: Users can create custom templates by writing/typing/drawing.

Image Sending: Send images from phone to your partner.

Video Sending: Send videos from phone to your partner.

Voice Recording: Send videos from phone to your partner.

Location Sharing: Share your location via GPS.

Camera: Captures and shares marriage moments via beautiful photos and videos.

Notifications: Updates user regarding partner's activities:

- Calendar updates
- Finance changes
- Mood changes
- New emails
- New love notes
- Point updates
- Virtual gifts
- Virtual hugs
- Virtual kisses

Tab 2: Side Panel: Provides access to other functions of the Marriage Machine.

Calendar:

Synchronize: Automatically syncs the user's calendar activities with partner's.

Joint Activities: Just-in-time detection of free time slots, prompting users to engage in joint activities, *e.g.*, dining, entertainment, sports, travel, volunteering.

Important Dates: Just-in-time reminders partner's birthdays, anniversaries, etc.

To-do lists: Multiple lists, with deadline-prompts, for shopping and other tasks that allow the couple to divide chores and signal when finished.

Gallery:

Album:

- Search/save photos/videos in folders with option to title, date, tag, and describe events
- Enable photo upload or download
- Add filters/frames on images
- Create slide show with music.

Shared Moments: Users can "look back" on memories they have shared together, with prompts to create albums after completing joint activities, with categories according to media type, with doodles sent via text messaging, and all other media on Chat.

Music: Send and save music files. Create shared playlists.

Couple Services: The Marriage Machine offers a suite of services designed to help couples in many aspects of their marriage:

Tips/Advice: Provides expert knowledge to couples on ways they can:

- Enhance their love map
- Nurture fondness
- Turn toward each other
- Resolve conflicts
- Create shared meaning
- Cultivate excitement
- Impeocw communication.

Finance Tracker: Users link their credit cards to app to track spending patterns. They can set long-term/short-term objectives and goals, and view metrics to measure these objectives and goals. The app supports just in time functionality to notify users when credit goals/limits are approaching.

Gift Store:

- Purchase gifts from online merchandise store.
- Link to existing online shops (e.g. retail, romantic gifts, music, books, etc.)
- Deliver products in romantic gift wrap
- Create wish lists

- Earn points for discounts
- Just-in-time tip: suggest gifts based on partner's browsing/purchase history, and
- partner's favorites from wish list and preferences.

Games: Games will stimulate/increase users' motivation to create/share marriage moments. For example, the attribution of points to redeem at the gift shop represents a strong incentive and increases use frequency. Games also add fun/play/entertainment.

Cooperative Games: These games are played together in real-time

- Drawing-guessing game: random word generated based on category
- Hangman: user inputs word; partner guesses.

Learning Games: These games are played individually

- Crossword puzzle: decode puzzle made up of info about partner
- Quiz: answer personal questions about partner and his/her family.

My Points: Users can view a scoreboard to check their current points.

- The app supports just-in-time functionality to prompt users to buy virtual gifts when points are sufficient
- Earn points via completed joint activities, to-do lists, love notes, games, virtual hugs/kisses, and finance tracker
- Earn points to buy virtual gifts such as Flowers, Diamond rings, Romantic balloons, Cakes, Teddy bears
- Earn points to upgrade fun interactions and virtual gifts.

Settings:

Profile:

- Edit profile photo
- Input personal data and preferences

Security:

- Change password
- Mobile security for credit card details
- Shared password

Dashboard:

- Change wallpaper
- Location (GPS/Manual)/News
- My mood, Partner's mood
- Weather/Time

Notification/Alert:

- Alert sound/vibrate
- Lock screen alert
- Message alert pop-up
- Message preview

About us:

- Developer info
- Version info

Tutorial/Help:

- Contact us/Feedback
- FAQ/Troubleshooting
- How to use
- Introductory tutorial
- Privacy/security policy
- Terms of service

Tips: Marriage Machine users will be assisted and accompanied by a mobile marriage "advisor." Based on users' characteristics, needs, and preferences; on usage behaviors;

and on the respective usage environment, the advisor provides personalized and tailor-made offers and recommendations.

8   Screen Designs

Based on the information architecture, AM+A prepared initial design sketches of some key screens and, based on internal reviews, revised them (see Fig. 2(a)–(h)).
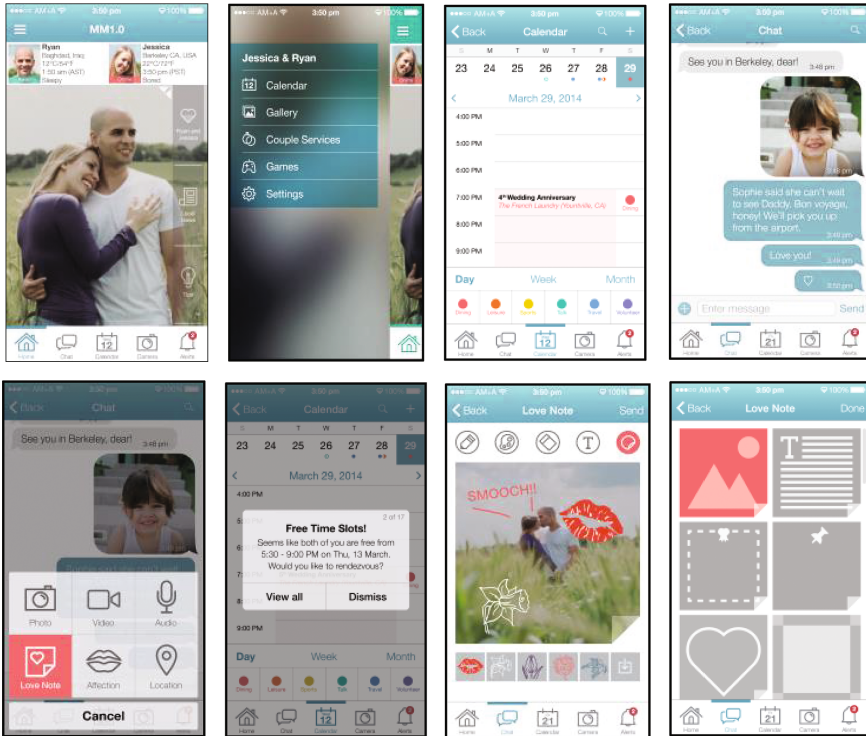

Fig. 2. (a) and (b) Landing and Side panel menu screen, (c) and (d) Shared Calendar screens, (e)–(h) Chat Love Note screens

Landing Screen: Typifies main menu and app instruction throughout.

Side Panel: Provides primary features. Screens swiped at any time to reveal them.

Shared Calendar: Allows both parties to view partner's schedule. It also acts as a personal assistant by sending date suggestions if both parties are free.

Chat: Besides typical functions, allows user to send customized interactions, such as Love Notes and Virtual Hugs and Virtual Kisses.

9 Usability Testing

We recruited users from the UC Berkeley Extension. In each of three 15-min sessions we explained the test and asked participants to view the Marriage Machine perceptual screens. We asked questions about their impressions of the application's purpose, screen designs, and organization. We gave them navigation tasks to accomplish and asked the participants these follow-up questions: Their overall impression of the Marriage Machine, *w*hether some section(s) seemed confusing *w*hether they would like to use the mobile application*, w*hether they would recommend this app for someone*, and t*heir overall rating of the app.

Participants: All participants were undergraduate students from UC Berkeley Extension. Eight were scheduled over three test sessions. Six completed the test. Of the six participants, three were male and three were female.

Evaluation Tasks/Scenarios: Participants attempted to complete the following tasks:

- *Task 1* Navigating from the dashboard find the side panel
- *Task 2* Finding the settings and activating the "shared password" function
- *Task 3* Returning to the dashboard from the settings;
- *Task 4* Navigating to the chat function
- *Task 5* Finding the button that leads to the chat screen to add a "love note"
- *Task 6* Choosing a love note template
- *Task 7* Adding a kiss sticker and typing a message in the picture.

Results: All successfully completed Task 1, 2, 3, 4, and 6. One could not complete Task 5. One user could not complete Task 7, requiring use of two different functions.

10 Conclusions

The Marriage Machine is conceived to motivate and persuade couples to open themselves up towards techniques of daily practice and interaction with their partners, with the goal of making their relationships with each other deeper, more enjoyable, more personally enriching, and educational. The application incorporates persuasive and motivational elements in order to stimulate users to reflect on and change their behavior. Based on user tests, we found that App Rating 67 % of our participants rated the app "very good" and 33 % rated the app "excellent." With this information in mind, AM+A plans to continue development of the Marriage Machine.

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